

II. SPECIFICATION AMENDMENTS

Page 1, before line 1, insert

(a) TITLE OF THE INVENTION;

Page 1, line 1,

WIRELESS ACCESS DEVICE [S]

Page 1, line 2, insert

(b) CROSS-REFERENCE TO RELATED APPLICATIONS

Not Applicable

(c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

Not Applicable

(d) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC

Not Applicable

(e) BACKGROUND OF THE INVENTION

(1) Field of the Invention

Page 1, line 5, insert

(2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98;

Page 1, line 27, insert

(f) BRIEF SUMMARY OF THE INVENTION;

Page 2, line 9, insert

(g) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S);

Page 3, line 25, insert

(h) DETAILED DESCRIPTION OF THE INVENTION;

Page 4, line 29 to page 6, line 29,

The mobile station 8 has a second antenna 20. The second antenna is arranged to receive and transmit signals in the Bluetooth BLUETOOTH wireless PC card range of frequencies. Bluetooth BLUETOOTH wireless PC card is a standard which has bee proposed for short range, low power, high frequency signals. Typically, the signals will be of the order of a giga Hertz. The second antenna 20 is arranged to receive Bluetooth BLUETOOTH wireless PC card signals from a Bluetooth BLUETOOTH wireless PC card device. The signals received by the second antenna are forwarded to a Bluetooth BLUETOOTH wireless PC card transceiver 22. The Bluetooth BLUETOOTH wireless PC card transceiver 22 performs similar functions to the radio frequency transceiver 12. In particular, the Bluetooth BLUETOOTH wireless PC card transceiver 22 downconverts the received signals to a baseband frequency. If required, the Bluetooth BLUETOOTH wireless PC card transceiver may demodulate and decode the received signal. The received signals may be forwarded to the processor 14 for further processing.

The Bluetooth—BLUETOOTH wireless PC card transceiver 22 is also arranged to receive information from the processor 14. The received information is at the baseband frequency, and the Bluetooth BLUETOOTH wireless PC card transceiver upconverts the

signals to the ~~Bluetooth~~ BLUETOOTH wireless PC card frequency so that they can be transmitted by the second antenna. If required, the ~~Bluetooth~~ BLUETOOTH wireless PC card transceiver 22 will modulate, encode and perform any other required function.

The ~~Bluetooth~~ BLUETOOTH wireless PC card transceiver 22 is arranged to have access to the memory 18 and can retrieve information stored therein. In alternative embodiments of the present invention, the information may be retrieved by the processor from the memory and forwarded to the ~~Bluetooth~~ BLUETOOTH wireless PC card transceiver 22.

Reference will now be made to Figure 3, which schematically illustrates embodiments of the present of the present invention. The mobile station 8 is arranged to have a ~~Bluetooth~~ BLUETOOTH wireless PC card connection with a ~~Bluetooth~~ BLUETOOTH wireless PC card device 24. This means that signals are exchanged between the mobile device and the ~~Bluetooth~~ BLUETOOTH wireless PC card device in accordance with the ~~Bluetooth~~ BLUETOOTH wireless PC card standard. With the ~~Bluetooth~~ BLUETOOTH wireless PC card standard, two devices are able to communicate directly without going via, for example, a base station.

In embodiments of the present invention, it is proposed that the ~~Bluetooth~~ BLUETOOTH wireless PC card device be a lock or an access device. For example, the ~~Bluetooth~~ BLUETOOTH wireless PC card device may be provided on a hotel door. The ~~Bluetooth~~ BLUETOOTH wireless PC card device may be part of an access device. For example, the access device 24 may permit access to a cinema, public transport, a ski lift or the like. Alternatively, the ~~Bluetooth~~ BLUETOOTH wireless PC card device may, for example, be incorporated in a rental car or the like. Embodiments of the

present invention are particularly suitable for allowing access to a given user temporarily. However, embodiments of the present invention can be used in other situations.

The communications between the mobile device and the ~~Bluetooth~~ BLUETOOTH wireless PC card device 24 are via the second antenna 20 of the mobile station 8.

Reference is made to Figure 4, which shows the ~~Bluetooth~~ BLUETOOTH wireless PC card device 24 of Figure 3 in more detail. The ~~Bluetooth~~ BLUETOOTH wireless PC card device 24 has an antenna 26. This antenna 26 is arranged to receive and transmit signals at the ~~Bluetooth~~ BLUETOOTH wireless PC card frequency. More particularly, the antenna 26 is arranged to transmit signals to the second antenna of the mobile station and to receive signals therefrom. The ~~Bluetooth~~ BLUETOOTH wireless PC card device has an upconverter 28. The upconverter 28 is arranged to upconvert signals from a baseband frequency to the ~~Bluetooth~~ BLUETOOTH wireless PC card frequency for transmission by the antenna 26. The upconverter 28 may carry out other functions such as modulation, encoding or any other suitable function.

The signals which are received by the antenna 26 are processed by a downconverter 30 which reduces the frequency of the received signals from the ~~Bluetooth~~ BLUETOOTH wireless PC card frequency to the baseband frequency. Again, the downconverter 30 may perform other functions such as demodulation or decoding.

The signals which are received by the antenna 26 and down converted by the downconverter 30 are output to a processor 32, which is able to process the received signals further. Likewise, the processor 32 is arranged to output those signals which are to be transmitted to the upconverter 28. The ~~Bluetooth~~ BLUETOOTH

wireless PC card device 24 also has a memory 32 which is used to store information. This will be described in more detail hereinafter.

Page 7, lines 8-25,

Reference will now be made to Figure 5, which shows a flow diagram of the steps of the method embodying the present invention and illustrates how embodiments of the present invention work. The mobile station 8 is arranged in step S1 to establish a connection with the network 36 via the base transceiver station 610. In the embodiment described, the mobile station is a WAP (wireless application protocol) mobile station. However, it should be appreciated that the mobile device may be in accordance with any other protocol and may, for example, be able to use the short message servicing SMS feature in embodiments of the invention. The network is also arranged to establish via the gateway 38 a connection with a server. This server 40 is associated with the service provider. For example, if embodiments of the present invention are to be used to allow access to hotel rooms, then the server 40 would be associated with the hotel. As an alternative, the mobile station 8 could also access the server provider via ~~Bluetooth~~ BLUETOOTH wireless PC card transceiver connected to the server. In this way, the mobile station can get the key over the ~~Bluetooth~~ BLUETOOTH wireless PC card connection without the need for network connection. Cost would also be reduced. If, however, an order for a service (for example a hotel room) was made in advance, the key could be obtained remotely via the base transceiver station 610 using WAP and SMS.

Page 8, line 22, to page 10, line 5

In the next step S3, the mobile station is arranged to establish a Bluetooth BLUETOOTH wireless PC card connection with the Bluetooth BLUETOOTH wireless PC card device 24. The connection with the Bluetooth BLUETOOTH wireless PC card device 24 can take place some time after the first two steps are being completed. As indicated previously, Bluetooth BLUETOOTH wireless PC card is a standard which has been proposed to permit the direct communication between two devices. One feature of the Bluetooth BLUETOOTH wireless PC card standard is that each packet is transmitted with a different frequency.

Once the Bluetooth BLUETOOTH wireless PC card connection has been established, in step S4 the mobile station sends the key information to the Bluetooth BLUETOOTH wireless PC card device. This may be in response to a request from the Bluetooth BLUETOOTH wireless PC card device for the key.

In the step S5, the Bluetooth BLUETOOTH wireless PC card device will check the validity of the key. In particular, the Bluetooth BLUETOOTH wireless PC card device attempts to decrypt the keys and will compare it with key information which it has stored thereon.

In step S6, if the key is valid, then the Bluetooth BLUETOOTH wireless PC card device 24 will provide access for example to the room.

In the embodiments of the present invention, it is envisaged that the mobile station could be used to store more than one key. So that the Bluetooth BLUETOOTH wireless PC card device 24 is able

to receive the correct key, it is preferred that each key has an identification tag which identifies the service provider. The Bluetooth BLUETOOTH wireless PC card device would in its request sent to the mobile station for the key include this information identifying the associated service provider. The mobile station would then only send the key(s) which have the tag associated with the given service provider. Where a number of different keys are associated with the give service provider, the Bluetooth BLUETOOTH wireless PC card device could try all of the keys to see which one matches. It is of course possible in embodiments of the present invention that each Bluetooth BLUETOOTH wireless PC card device has a unique identity tag so that the mobile station only sends the key which matches that identity tag provided by the Bluetooth BLUETOOTH wireless PC card device.

In alternative embodiment of the present invention, the mobile station may provide all of the keys which it has to the Bluetooth BLUETOOTH wireless PC card device which will then test all of them in order to determine which key is the correct key. This may be less preferable to those embodiments where security is of importance.

The key may have a time limit beyond which it is not valid. For example, a hotel room key may be only valid for the time that the user stays in the hotel. Accordingly, in some embodiments of the present invention, time information may form part of the key. Alternatively, there may be separate information provided relating to time information. The Bluetooth BLUETOOTH wireless PC card device, when determining if the key is valid or not, will check to see whether or not the key is still valid. The time information may take any suitable format such as a start time and/or an end time or any other suitable format. For this, the

Bluetooth BLUETOOTH wireless PC card device will require access to a clock. That may be part of the Bluetooth BLUETOOTH wireless PC card device itself or the information may be provided by the mobile station.

Page 10, lines 18-20,

It should be appreciated that any suitable way of transmitting key data securely between the server, the mobile station and the Bluetooth BLUETOOTH wireless PC card device may be used. In many of these forms the BTS and GW would not be needed.

Page 11, lines 1-4,

In embodiments of the present invention, the mobile station has been described as using the Bluetooth BLUETOOTH wireless PC card protocol. However, in alternative embodiments of the present invention, different radio frequencies can be used. For example, infrared, wireless LAN and HomeRF could be used instead of the Bluetooth BLUETOOTH wireless PC card.

Page 11, line 30, to Page 12, line 18

In embodiments of the present invention, there is no need to connect each of the Bluetooth BLUETOOTH wireless PC card devices together to a central control element. This is because of the provision of information relating to the time for which the key is valid. In the case of a lock, the key used by the lock does not have to be continually changed. For example, a hotel room

may be validly opened by a user one day, but if the user has not requested the room for an additional day, the user will not be permitted to enter that room on the next day. Thus, the need for additional infra structure connecting the ~~Bluetooth~~ BLUETOOTH wireless PC card devices can be avoided. The validity time for the key can be in the non-encrypted part of the key so that the mobile station can remove it automatically. Also, this would allow the ~~Bluetooth~~ BLUETOOTH wireless PC card device to send a request to the mobile station to remove the key. As an alternative, rather than a valid time information, any other validity information indicating the validity of the user or validity of the use of the item being accessed can be transferred. For example, a maximum speed for a hire car during use could be stipulated.

The access key is stored in the memory 18 of the mobile station. Alternatively, the access key may be stored in an integrated part of the device for example on a smart card. The key information is also stored in the memory 34 of the ~~Bluetooth~~ BLUETOOTH wireless PC card device. Again, the information may be stored in any other suitable location in the ~~Bluetooth~~ BLUETOOTH wireless PC card device.

Page 12, line 23, to Page 13, line 3,

In alternative embodiments of the present invention, the mobile station may be arranged to provide the ~~Bluetooth~~ BLUETOOTH wireless PC card device with user identification information. This may be part of the key or separate therefrom. This information can be used to provide additional security. For example, in the car rental situation, the user may be required to

identify himself by entering a personal identification number code to prevent misuse or crime. Additionally, the key may be stored in the part of the memory which requires the user to enter their personal identity number (PIN). Without the PIN the mobile station will not send the key. Additionally, each key can be provided with its own PIN. The user needs to know the PIN in order to use the key. The mobile station sends the key together with the PIN (the PIN could be, for example, part of the key for decryption). Furthermore, no PIN might be required.

Page 13, lines 11-15,

In alternative embodiments of the present invention, a single antenna may be provided in the mobile station and the key information and the like may be provided to the mobile station using the same antenna which is used to send the key information to the accessed entity. That single antenna may be arranged to use the ~~Bluetooth~~ BLUETOOTH wireless PC card standard or the usual mobile station frequencies